Ability to Predict *Zostera marina* Cover Based on Geomorphic and Hydrologic Variables in Puget Sound, Washington

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Zostera marina (eelgrass) is a nearshore vascular plant that provides important ecological functions including habitat for forage fish and threatened salmonids in Puget Sound. However, we do not presently have a spatially explicit dataset that describes *Z. marina* cover as a continuous variable. Current monitoring estimates of cover from WDNR use random samples and spatial extrapolation based on bathymetry as the only physical constraint. Because we know distribution patterns are constrained by other geomorphic and hydrologic variables, we investigated our ability to predict *Z. marina* cover using existing data with variables that include substrate, exposure, proxies for water quality, as well as a new dataset describing beach form throughout Puget Sound that integrates a number of physical variables. We develop relationships using multiple regression and principal components regression. These techniques minimize redundancy in the predictor variables and, more importantly, give robust estimates of uncertainty in the relationships. We evaluate the results as a basis for improving the spatial extrapolation of the current monitoring program and as a tool to help prioritize nearshore habitat and restoration sites. We also discuss the utility of these results in supporting modeling of nearshore primary production.